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09/736,073	12/13/2000	David J. Elliott	UV-102J	7710

7590

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EXAMINER

CROWELL, ANNA M

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 06/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-4

Office Action Summary

Application No.

09/736,073

Applicant(s)

ELLIOTT ET AL.

Examiner

Michelle Crowell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 21,22 and 30-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15,17-20 and 23-29 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☒ Claim(s) 1-33 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5. 6) ☐ Other:

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DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species of the claimed invention:

Species I - Figure 2

Species II - Figure 9

Species III - Figure 11

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claim 1 is generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to

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be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

2. During a telephone conversation with Jason Shanske on May 30, 2002 a provisional election was made with traverse to prosecute the invention of Species I, Figure 2, claims 1-20, and 23-29. Affirmation of this election must be made by applicant in replying to this Office action. Claims 21, 22, and 30-33 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim 22 is withdrawn because there is no support in the specification for the reaction chamber at atmospheric pressure. The pressure range for the claimed reaction chamber is approximately 450-700 torr (page 11, line 3 of the specification).

Information Disclosure Statement

3. The information disclosure statement filed August 8, 2001 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the article by Future Fab International does not include a publication date and a copy of Des. 275,032 has not been provided. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the heating elements and the adjustable slits must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Delivery pipe 21 is not labeled in the drawings. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 6 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claim 6 recites the limitation “consists of at least two cylindrical refractive elements”.

The term “at least two” can be interpreted as having two or more, however the transition phrase “consists of” is of the closed type and thus can only have the claimed components. Therefore, the claim must be interpreted as having only two cylindrical refractive elements.

Claim 15

The appearance and operation of the adjustable slits is unclear. The adjustable slits are not adequately described in the specification.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

9. Claims 1,7-13, 17-20, 24-28 are rejected under 35 U.S.C. 102(a) as being anticipated by Murakami (U.S. 6,090,458).

Referring to Figures 3 and 10, column 3, lines 27-52, column 4, lines 22-36, and column 7, line 55 – column 8, line 17, Murakami discloses an apparatus which uses a rectangular ultraviolet laser beam 30 and reactive gas $\text{Cr}(\text{CO})_6$ to deposit metallic chromium on the substrate 104. The apparatus includes a chamber 103, glass window 111 (UV window) located on the top of chamber 103, beam expander 107 (beam forming module), rectangular ultraviolet laser beam 30, gas inlet port 102 (gas injection module), gas exhaust port connected to exhaust gas treatment

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117 (gas exhaust module), heater 125 (heating elements) and X-Y stage 112 for heating and securely holding the substrate (vacuum chuck), dichroic mirror 109 for adjusting the angle of the rectangular beam, laser oscillator 20 (UV radiation source raw output), and object lens 110.

In addition, while the gas inlet and outlet are stationary, the X-Y stage 112 moves the substrate 104 to the desired position for deposition.

Regarding Claims 7-13 and 25

The apparatus of Murakami is capable of administering the various claimed processes with the appropriate processing materials supplied. (i.e. etching reaction, deposition reaction, oxidation reaction, reduction reaction, melting reaction, reaction for modifying a metallic or non-metallic film, polymerization or UV curing reaction, and doping reaction). Furthermore, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Accordingly, these claims are anticipated.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Elliott et al. (U.S. 5,814,156) and Schmidt et al. (U.S. 4,264,330).

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Murakami fails to teach the wavelength of the UV radiation source raw output, energy level of the rectangular beam, optical elements, two cylindrical refractive elements, dimensions of the rectangular beam.

Referring to column 4, lines 4-15, and column 5, lines 53-59, Elliott teaches an apparatus which uses an ultraviolet radiation beam to clean (etch) the surface of a substrate. The laser source 22 provides a pulsed beam 24 (ultraviolet radiation beam) at wavelengths of 248 nm and 193 nm. Typical energy density levels at 248 nm range from 250-1500 mJ/cm² (0.25 – 1.5 J/cm²). The laser source 22 further includes a beam expanding system 26 (beam forming module) made up of two cylindrical mirrors 54 and 56 (two cylindrical refractive elements). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami with the wavelength of the UV radiation source raw output, energy level of the rectangular beam, optical elements, and two cylindrical refractive elements as taught by Elliott. This would ensure the appropriate wavelength and energy level necessary for the desired process. In addition, the cylindrical refractive elements (optical elements) create the rectangular beam in the desired dimension.

Referring to column 2, lines 47-52, Schmidt shows an ultraviolet beam 6 directed on vessel 1 with a length of 600 mm and width of 1mm.

In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform

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differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami with the dimensions as shown by Schmidt. This would ensure the appropriate dimension of the rectangular beam necessary for the desired process.

12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) Giapis et al. (U.S. 5,002,631).

Murakami fails to teach a block shaped manifold.

Referring to Figure 1 and column 3, lines 13-15, Giapis teaches a valve-controlled aperture 103 (block shaped manifold) with pump used to exhaust out gaseous reaction products. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami with the valve-controlled aperture as taught by Giapis. This would allow gaseous reaction products to be exhausted.

13. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Lee et al. (U.S. 6,374,770).

Murakami fails to teach an electronic control module.

Referring to Figure 1 and column 4, lines 46-50, Lee teaches a CVD apparatus which uses a processor 34 operated by a computer program stored in memory 38 for a deposition reaction. The computer program selects the timing, mixture of gases, chamber pressure, chamber temperature, RF power levels, susceptor position, and other parameters of a particular

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process. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami in view of Elliott and Schmidt with a processor as taught by Lee. This would control various processing parameters to yield the optimum processing environment for deposition.

14. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Morishige (U.S. 6,136,096).

The teachings of Murakami have been discussed above.

Murakami fails to teach the gas injection module delivering a second fluid or vapor to the substrate surface.

Referring to Figure 1, column 3, lines 6-17, Morishige teaches an apparatus that uses gases and a laser beam to form layers on the substrate. Two gases ($\text{Cr}(\text{CO})_6$ and TDMAT) are supplied to the substrate 7 through input reservoir 16 and 17. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami in view of Elliott and Schmidt with a second fluid to the substrate as taught by Morishige. This would allow multiple, different layers to be deposited on the substrate.

Allowable Subject Matter

15. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956. The examiner can normally be reached on M-F (8:00 - 4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC 
June 21, 2002


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
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